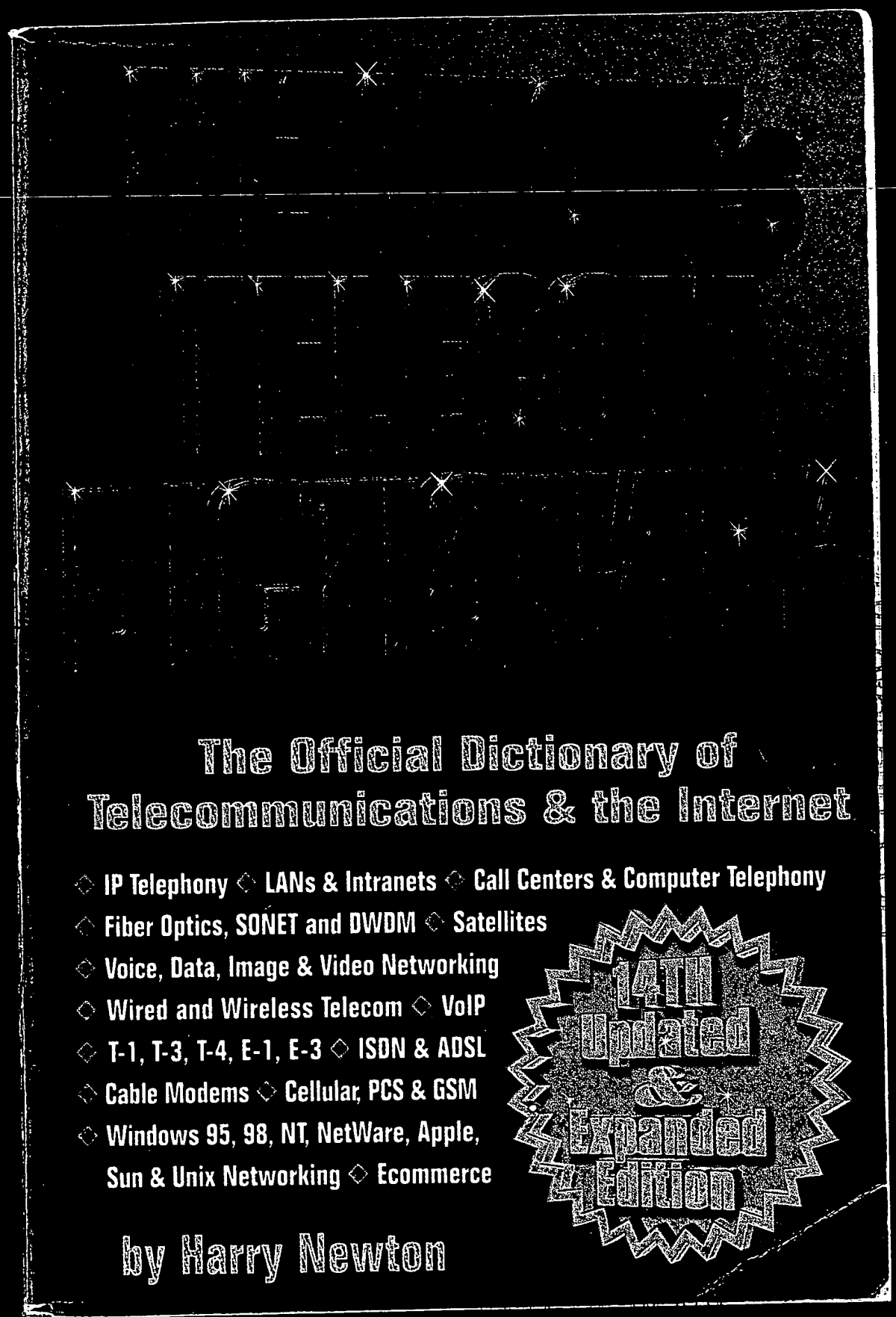
The Official Dictionary of
Telecommunications & the Internet
◇ IP Telephony ◇ LANs & Intranets ◇ Call Centers & Computer Telephony
◇ Fiber Optics, SONET and DWDM ◇ Satellites
◇ Voice, Data, Image & Video Networking
◇ Wired and Wireless Telecom ◇ VoIP
◇ T-1, T-3, T-4, E-1, E-3 ◇ ISDN & ADSL
◇ Cable Modems ◇ Cellular, PCS & GSM
◇ Windows 95, 98, NT, NetWare, Apple,
Sun & Unix Networking ◇ Ecommerce
14th Updated & Expanded Edition
by Harry Newton

and routing data needed to deliver advanced network services — like translating a dial calls into the required routing number. TCAP is useful also in coordinating some enhanced call-related services. For example, network ring again requires the connection of two users when both stations become idle. In this case, TCAP is used to coordinate between the users' switches while waiting for each line to become idle. And it can do this without tying up network trunks.

One of the major advantages of TCAP is that it provides a set of protocol building blocks for use in a variety of service definitions. The TCAP building blocks are subdivided into the transaction sublayer and the component sublayer. For more on TCAP, see the 1988-3 issue of Northern Telecom's Telesis publication.

TCAS T-Carrier Administration System. Provides mechanized support for the facility maintenance and administration center to achieve centralized administration and control of the digital network.

TCF Training Check Frame. Last step in a series of signals in a fax transmission called a training sequence, designed to let the receiver adjust to telephone line conditions.

Tchotchke A New York Jewish word meaning trinkets, best exemplified by the giveaway junk we often pick up at telecommunications trade shows.

TCIF TeleCommunications Industry Forum. A voluntary special interest group under ATIS (Alliance for Telecommunications Industry Solutions). TCIF addresses areas such as electronic commerce, including bar coding and EDI (Electronic Data Interchange). www.atis.org/atis/tcif/index.html See also ATIS.

TCM 1. Traveling Class Mark.

2. Trellis Coding Modulation.

3. Time Compression Multiplexing. A digital transmission technique that permits full duplex data transmission by sending compressed bursts of data in a "ping-pong" fashion.

4. Telecommunications Manager. The TCM is the manager of the department that plans, controls, and administers the telephony and telecommunications assets of the company. He ensures that the telephone and telecommunications systems are well-run and functioning smoothly. These assets may include the PBX and ISDN, T-1, local and long distance telephone lines, telephone sets, authorization codes, cable pairs, WANs, Fax machines, voice mail systems, automated attendants, interactive voice response systems, automatic call distribution, multiplexors, modem pools, etc. The internal data facilities such as LANs and routers may be under the administration of the TCM, or could be the responsibility of the Management Information Systems (MIS) department. But since the TCM has responsibility for both the inside wiring and the outside Carrier facilities, close coordination would be required if the internal data facilities are controlled by the MIS department.

The following are the functions of the TCM;

- Operating, administering, monitoring, and maintaining the existing telecommunications systems.
- Dealing with the various vendors and providers, including verifying and paying the bills.
- Preparing and managing the Telecommunications budget.
- Keeping abreast of changes in technology, services, industry structure, and rates.
- Assisting company management in developing a corporate telecommunications policy that meets business objectives.
- Developing and implementing company telephone and telecommunications procedures for efficient and cost effective use, and training company employees in these procedures.
- Upgrading, procurement, selecting, contracting, or purchasing a system, new system, equipment, or services.
- Planning and analyzing for growth, new requirements, or future functionality.

The goal of the TCM is to provide good telecommunications services for an organization and its employees at the lowest possible cost. This definition courtesy, Robert J. Perillo, Perillo@dockmaster.ncsc.mil.

TCNS Thomas Conrad Networking System is a 100 million bit per second proprietary networking system (LAN) based on ARCnet that can use most standard ARCnet drivers on any network operating systems.

TCO Total Cost of Ownership. A term coined by The Gartner Group to bring attention to the actual, total cost to the enterprise of owning a PC. The most figure in 1997 was $29,353 for owning a standard, networked, Windows 95 PC for a period of three years. Gartner cites the cost of a NetPC (Thin Client) at a much lower cost. The point is clear and fairly obvious — consider not only the acquisition/implementation cost of a workstation (networked or not), but also consider the total cost, including administration, maintenance, support, software upgrades and training.

TCP 1. Transmission Control Protocol. ARPAnet-developed transport layer protocol. Corresponds to OSI layers 4 and 5, transport and session. TCP is a transport layer, connection-oriented, end-to-end protocol. It provides reliable, sequenced, and unduplicated delivery of bytes to a remote or local user. TCP provides reliable byte stream communication between pairs of processes in hosts attached to interconnected networks. It is the portion of the TCP/IP protocol suite that governs the exchange of sequential data. See TCP/IP for a much longer explanation.

2. An ATM term. Test Coordination Procedure: A set of rules to coordinate the test process between the lower tester and the upper tester. The purpose is to enable the lower tester to control the operation of the upper tester. These procedures may, or may not, be specified in an abstract test suite.

TCP/IP According to Microsoft: Transmission Control Protocol/Internet Protocol (TCP/IP) is a networking protocol that provides communication across interconnected networks, between computers with diverse hardware architectures and various operating systems. TCP (Transmission Control Protocol) and IP (Internet Protocol) are only two protocols in the family of Internet protocols. Over time, however, "TCP/IP" has been used in industry to denote the family of common Internet protocols. The Internet protocols are a result of a Defense Advanced Research Projects Agency (DARPA) research project on network interconnection in the late 1970s. It was mandated on all United States defense long-haul networks in 1983 but was not widely accepted until the integration with 4.2 BSD (Berkeley Software Distribution) UNIX. The popularity of TCP/IP (Harry's note: it's the Internet's networking protocol) is based on:

- Robust client-server framework. TCP/IP is an excellent client-server application platform, especially in wide-area network (WAN) environments.
- Information sharing. Thousands of academic, defense, scientific, and commercial organizations share data, electronic mail and services on the connected Internet using TCP/IP.
- General availability. Implementations of TCP/IP are available on nearly every popular computer operating system. Source code is widely available for many implementations. Additionally, bridge, router and network analyzer vendors all offer support for the TCP/IP protocol family within their products.

TCP/IP is the most complete and accepted networking proto-

col available. Virtually all modern operating systems offer TCP/IP support, and most large networks rely on TCP/IP for all their network traffic. Microsoft TCP/IP provides cross-platform connectivity and a client-server development framework that many software vendors and corporate developers are using to develop distributed and client-server applications in heterogeneous enterprise networks over TCP/IP.

How TCP Works: TCP is a reliable, connection-oriented protocol. Connection-oriented implies that TCP first establishes a connection between the two systems that intend to exchange data. Since most networks are built on shared media (for example, several systems sharing the same cabling), it is necessary to break chunks of data into manageable pieces so that no two communicating computers monopolize the network. These pieces are called packets. When an application sends a message to TCP for transmission, TCP breaks the message into packets, sized appropriately for the network, and sends them over the network.

Because a single message is often broken into many packets, TCP marks these packets with sequence numbers before sending them. The sequence numbers allow the receiving system to properly reassemble the packets into the original message. Being able to reassemble the original message is not enough, the accuracy of the data must also be verified. TCP does this by computing a checksum. A checksum is a simple mathematical computation applied, by the sender, to the data contained in the TCP packet. The recipient then does the same calculation on the received data and compares the result with the checksum that the sender computed. If the results match, the recipient sends an acknowledgment (ACK). If the results do not match, the recipient asks the sender to resend the packet. Finally, TCP uses port IDs to specify which application running on the system is sending or receiving the data.

The port ID, checksum, and sequence number are inserted into the TCP packet in a special section called the header. The header is at the beginning of the packet containing this and other "control" information for TCP.

How IP Works: IP is the messenger protocol of TCP/IP. The IP protocol, much simpler than TCP, basically addresses and sends packets. IP relies on three pieces of information, which you provide, to receive and deliver packets successfully: IP address, subnet mask, and default gateway.

The IP address identifies your system on the TCP/IP network. IP addresses are 32-bit addresses that are globally unique on a network. They are generally represented in dotted decimal notation, which separates the four bytes of the address with periods. An IP address looks like this: 102.54.94.97

Although an IP address is a single value, it really contains two pieces of information: (a.) Your system's network ID, and (b.) Your system's host (or system) ID.

The subnet mask, also represented in dotted decimal notation, is used to extract these two values from your IP address. The value of the subnet mask is determined by setting the network ID bits of the IP address to ones and the host ID bits to zeros. The result allows TCP/IP to determine the host and network IDs of the local workstation. Here's how to understand an IP address. For example:

When the IP address is 102.54.94.97 (specified by the user)
And the subnet mask is 255.255.0.0 (specified by the user)
The network ID is 102.54 (IP address and subnet mask)
And the host ID is 94.97 (IP address and subnet mask)

OK. the above was Microsoft's definition. Here's my definition, which covers some areas Microsoft doesn't. TCP/IP is a set of protocols developed by the Department of Defense to link dissimilar computers across many kinds of networks, including unreliable ones and ones connected to dissimilar LANs. TCP/IP is the protocol used on the Internet. It is, in essence, the glue that binds the Internet. Developed in the 1970s by the U.S. Department of Defense's Advanced Research Projects Agency (DARPA) as a military standard protocol, its assurance of multi vendor connectivity has made it popular among commercial users as well, who have adopted TCP/IP. Consequently, TCP/IP now is supported by many manufacturers of minicomputers, personal computers, mainframes, technical workstations and data communications equipment. It is also the protocol commonly used over many Ethernet LANs (as well as X.25) networks. It has been implemented on everything from PC LANs to minis and mainframes.

TCP/IP currently divides networking functionality into only four layers:

A Network Interface Layer that corresponds to the OSI Physical and Data Link Layers. This layer manages the exchange of data between a device and the network to which it is attached and routes data between devices on the same network.

An Internet Layer which corresponds to the OSI network layer. The Internet Protocol (IP) subset of the TCP/IP suite runs at this layer. IP provides the addressing needed to allow routers to forward packets across a multiple LAN inter network. In IEEE terms, it provides connectionless datagram service, which means it attempts to deliver every packet, but has no provision for retransmitting lost or damaged packets. IP leaves such error correction, if required, to higher level protocols, such as TCP.

IP addresses are 32 bits in length and have two parts: the Network Identifier (Net ID) and the Host Identifier (Host ID). Assigned by a central authority, the Net ID specifies the address, unique across the Internet, for each network or related group of networks. Assigned by the local network administrator, the Host ID specifies a particular host, station or node within a given network and need only be unique within that network.

A Transport Layer, which corresponds to the OSI Transport Layer. The Transmission Control Protocol (TCP) subset runs at this layer. TCP provides end-to-end connectivity between data source and destination with detection of, and recovery from, lost, duplicated, or corrupted packets — thus offering the error control lacking in lower level IP routing. In TCP, message blocks from applications are divided into smaller segments, each with a sequence number that indicates the order of the segment within the block. The destination device examines the message segments and, when a complete sequence of segments is received, sends an acknowledgement (ACK) to the source, containing the number of the next byte expected at the destination.

An Application Layer, which corresponds to the session, presentation and application layers of the OSI model. This layer manages the function required by the user programs and includes protocols for remote log-in (Telnet), file transfer (FTP), and electronic mail (SMTP). See OSI.

TCR 1. Transaction Confirmation Report. A report from a fax machine listing the faxes received and transmitted. It provides details about each fax, including date, time, the remote fax's number, results, total pages.

2. An ATM term. Tagged Cell Rate: An ABR service parameter, TCR limits the rate at which a source may send out-of-rate forward RM-cells. TCR is a constant fixed at 10 cells/second.

TCS 1. Transmission Convergence Sublayer: This is part of the ATM physical layer that defines how cells will be transmitted by the actual physical layer.